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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/718,737

11/21/2003

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EXAMINER

DEB, ANJAN K

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,737

Applicant(s)

TRIFILO, TIMOTHY M.

Examiner

Anjan K. Deb

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8, 9, 15-20, 22-26 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☒ Claim(s) 7, 10-14, 21, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/21/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 22-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 recites the limitation "arbitrary sequence of signals". There is insufficient antecedent basis for this limitation in the claim.

Claims 24-26 recites the limitation "four inverter transistors". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kawada (US 3,932,806).

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Re claim 1, Kawada discloses method and apparatus to determine the presence of an electrical machine (detecting open circuit of transformer coil) connected to an electronic control circuit comprising generating (40) a pulse signal to a selected driven phase winding (primary winding)(column 7 lines 45-55), and detecting said pulse signal for the purpose of one of a signal presence and absence thereof at a non-driven phase winding (secondary winding) as a result of said pulse signal, wherein presence of said signal at said non-driven phase winding is indicative of motor (transformer) connected to the electronic control circuit (40). A transformer (induction type electrical machine) type is broadly interpreted as a motor as they are both induction type electrical machine.

4. Claims 1, 2, 5, 6, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Branch (US 3,932,811).

Re claims 1, 15, Branch discloses (Fig. 1) method and apparatus to determine the presence of an electrical machine comprising a stator having plurality of phase windings 12 (column 3 lines 14-26) connected to an electronic control circuit (windings are properly connected)(column 1 lines 11-22), comprising generating a pulse signal (test signal) to a selected driven phase winding (main winding 12)(column 7 lines 45-55), and detecting said pulse signal for the purpose of one of a signal presence and absence thereof at a non-driven phase winding as a result of said pulse signal, wherein presence of said signal at said non-driven phase winding (magnetic field produced at a second winding) is indicative of the motor connected to the electronic control circuit.

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Re claims 2,16 Branch discloses absence of said signal at said non-driven phase winding (magnetic field produced at a second winding) is indicative of the electric machine lacking connection (windings are properly connected)(column 1 lines 11-22), with the electronic control circuit.

Re claim 5, Branch discloses electric machine is connected to the electronic control circuit (Test circuit), the electronic control circuit is operative to control the electric machine having one or more magnetic components (first and second windings).

Re claim 6, Branch discloses non-driven phase winding includes non-driven phase windings (second winding) adjacent said driven phase winding (main winding).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 5, 6, 15, 16, 19, 20, 26, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Fig. 1).

Re claims 1, 2, 15, 16 admitted prior art (Fig. 1) discloses method and apparatus to determine the presence of an electrical machine 12 connected to an electronic control circuit 14,20 comprising generating a pulse signal (from switching device Q1) to a

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selected driven phase winding, and detecting said pulse signal in a non-driven phase (back EMF).

Admitted prior art did not expressly state detecting pulse signal (back EMF) for the purpose of detecting one of a signal presence and absence thereof at a non-driven phase winding as a result of said pulse signal, wherein presence of said signal (back EMF) at said non-driven phase winding is indicative of the motor connected to the electronic control circuit. However, it would be obvious for one of ordinary skill in the art to realize that an absence of a back EMF would indicate absence of any induced voltage from the driven phase to non-driven phase

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify admitted prior art by incorporating the admitted prior teaching of measuring back EMF that is developed at non-driven phase winding for detecting if the motor 12 is connected to the electronic control circuit 14 (absence of any induced voltage).

Re claims 5,19 admitted prior art discloses electric machine is connected to the electronic control circuit (14,20), the electronic control circuit is operative to control the electric machine having one or more magnetic components (windings).

Re claims 6, 20, 26 admitted prior art discloses non-driven phase winding includes non-driven phase windings adjacent said driven phase winding (inherent) including four inverters (Q1, Q2, Q3, Q4).

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Re claim 29, admitted prior art discloses all of the claimed limitations as set forth above including storage medium with computer program (DSP) for determining the presence of an electric machine connected to electronic control circuit (Fig. 1).

7. Claims 3, 4, 8, 9, 17, 18, 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (Fig. 1) in view of Coffeen (US 6,549,017 B2).

Re claims 3, 4, 8, 9, 17, 18, 22-25 admitted prior art discloses all of the claimed limitations as set forth above including four inverters (Q1,Q2,Q3,Q4)(Fig. 1) except generating an arbitrary sequence of pulses.

Coffeen discloses apparatus and method for testing electrical machine (transformer) using arbitrary sequence of test pulses (pulses are unpredictable and vary randomly from pulse to pulse)(column 7 lines 55-57) since it requires less expensive equipment for generating arbitrary sequence of test pulses.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify admitted prior art by adding generating arbitrary sequence of test pulses disclosed by Coffeen since it requires less expensive equipment for generating arbitrary sequence of test pulses.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branch (US 3,932,811) in view of Bajpai (US 4,985,857).

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Re claim 29, Branch discloses all of the claimed limitations except storage medium with computer program for determining the presence of an electric machine connected to electronic control circuit.

Bajpai (US 4,985,857) discloses storage medium with computer program for testing electric machine including connectivity (Fig. 10).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Branch by adding computer for implementing the test method of determining the presence of an electric machine connected to electronic control circuit for accurately determining a fault in the machine.

Allowable Subject Matter

9. Claims 7, 10-14, 21, 27, 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 7, 10-12, 21 are allowable for the inclusion of brushless DC (BLDC) motor and the electronic control circuit includes at least four inverter transistors configured to generate said pulse signal.

Claims 13, 14, 27, 28 are allowable for the inclusion of the claimed duty cycle range.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rasberry (US 5,740,600) discloses electric motor test apparatus and method comprising applying sequence of test pulses to stator winding.


Atarashi (US 20020113615) discloses DC motor test apparatus for detecting constant of brushless DC motor comprising inverter transistors for generating pulse signals.

Rohrbaugh (US 6,865,706 B1) discloses test apparatus and method for generating a set of test vectors (pulse signals) using arbitrary sequence of pulses comprising random and non-random pulse signals (test patterns) for testing integrated circuits.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



Anjan K. Deb

Patent Examiner

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3/14/05

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